DOCUMENT RESUME

ED 160 234 PS 010 162

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TITLE A Further Assessment of Predictors of the Child's Behavior in Dental Treatment.
SPONS AGENCY Rochester Univ., N.Y. Coll. of Arts and Sciences.
PUB DATE 78
NOTE 13p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Anxiety; *Childhood Attitudes; *Children; Dental Evaluation; *Dentistry; Elementary School Students; Evaluation Methods; Mother Attitudes; *Predictor Variables; *Reactive Behavior; Research

ABSTRACT

This study examines the relationship between children's disruptiveness during dental treatment and their state (contemporaneous or situational nervousness), trait (general nervousness), and specific dental anxiety. All patients studied were about 8 years old. Sample I (84 pedodontic patients) underwent a variety of dental procedures (extractions, restorations, etc.) on the day of evaluation. Sample II (48 pedodontic patients) underwent a dental restoration. Subjects in both these samples were assessed while under treatment for a procedure they had undergone in the past. Sample III consisted of 49 inexperienced patients who were studied during their first dental restoration or extraction. Before treatment, the patient's fear of dentistry was rated by his mother and the dentist. Children's self-reports of dental anxiety were also correlated with the data analysis. Results indicated only a slight relationship between behavioral and self-report measures of dental anxiety with the various predictor variables, and the child's behavior during treatment could not be predicted from any aspect of maternal anxiety. Findings suggest that the child's anxiety towards dental treatment is complexly determined, and that future research should include multiple measures of assessment. (Author/CM)

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Submitted for publication

ED160234

A Further Assessment of Predictors of the Child's Behavior in Dental Treatment

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PS010162

This research was supported by a grant from the Roche Psychiatric Service Institute to the first author. Computer time was funded by the College of Arts and Science of the University of Rochester. We acknowledge the gracious contributions to the research of Drs. Barbara Melamed and Stephen Adair; the staff of Eastman Dental Center; and numerous devoted undergraduate assistants.

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SYNOPSIS

The child's disruptiveness during dental treatment was related modestly to his age as well as his state, trait, and dental anxiety. In three samples comprising 132 experienced and 49 inexperienced pedodontic patients, the child's behavior during treatment could not be predicted from any aspect of maternal anxiety -- trait, state, or dental. Previous conceptions of maternal influence on the child's dental anxiety should be reevaluated.

Key Terms: State anxiety, trait anxiety, maternal anxiety, uncooperativeness, pedodontics.

A Further Assessment of Predictors of the Child's Behavior in Dental Treatment

A plethora of studies have documented an association between pedodontic patients' uncooperativeness in the initial treatment session and their mothers' trait anxiety, i.e. general nervousness, [1-6] as assessed on the Taylor Manifest Anxiety Scale.[7] However, this relationship has not been replicated among children with prior dental treatment.[4, 8-10]

A recent report[9] has suggested that this important theoretical question might be clarified by separate consideration of both the patient's prior experience in pedodontic treatment as well as various aspects of the patient's and his mother's anxiety. Whereas most previous research in this area has emphasized trait anxiety, this work should also consider state anxiety, i.e. contemporaneous or situational nervousness, and specific dental anxiety. The present paper is based on such an examination of two samples of experienced pedodontic patients and one sample of inexperienced patients.

Materials and Methods

In Study 1, there were 48 male and 36 female pedodontic patients with a mean chronological age of 8.87 years (S.D. = 2.01). These patients underwent a variety of dental procedures on the day of evaluation, including extractions, restorations, X-radiography, appliance adjustments, dental examinations, etc. In Study 2, there were 21 male and 27 female pedodontic patients with a mean age of 8.23 years (S.D. = 2.08) who underwent a dental restoration. Subjects in these two studies were assessed while under treatment for a procedure that they had undergone in the past. In Study 3, there were 22 male and 27 female pedodontic patients with a mean age of 8.21 years (S.D. = 2.20). These children were studied during their first dental restoration or extraction. All subjects were drawn from Eastman Dental Center, and subsets of the samples in Studies 2 and 3 underwent modeling procedures aimed at reducing anxiety after being

interviewed for the present research.

In this interview, the child was asked to rate verbally his nervousness (1 = Not at all afraid; 5 = Very afraid) concerning eight hypothetical dental situations selected by Melamed et al.[11] The subject also completed Venham's Picture Test,[12] a forced-choice projective test of state anxiety, as well as the state and trait scales of Spielberger et al's How I Feel Questionnaire.[13] During dental treatment, the child's anxious and disruptive behaviors were scored on Melamed et al's Behavior Profile Scale.[11] The judges' reliability on this instrument are reported elsewhere.[14] Finally, at the conclusion of treatment, the dentist rated the child's cooperativeness on Frankl et al's scale (1 = Definitely negative; 4 = Definitely positive).[15]

Before treatment, the patient's fear of dentistry was rated by his mother and dentist (1 = Not at all afraid; 5 = Very afraid). The mother also completed the following measures: (a) Wright and Alpern's[4] Maternal Questionnaire, which deals with the child's direct and vicarious experience with dental and medical treatment. This scale includes separate maternal ratings of both the child's and the mother's own state anxiety, which were scored separately, as described previously[9]; (b) the state and trait anxiety scales of the Self Evaluation Questionnaire[16]; (c) Corah's Dental Anxiety Scale[17]; and (d) a paper-and-pencil version of Melamed et al's[9,11] scale of dental anxiety, which was administered verbally to children.

Results

Rated and Observed Uncooperativeness

Table 1 displays correlation coefficients between cooperativeness ratings and the patient's age as well as several measures of the child's and mother's anxiety. Comparable data for the Behavior Profile observations appear in Table 2. Although cooperativeness tended to increase with age in each sample, this relationship did not attain significance. The same trend was present for

Behavior Profile scores and was significant for the experienced samples of Studies 1 and 2.

Cooperativeness was associated with low levels of each of the three measures of the child's state anxiety, but these correlations were significant only for the How I Feel Scale in Study 1. In contrast, Behavior Profile Scores were not significantly correlated with any measures of the child's state anxiety. In turn, the patient's trait anxiety was correlated with uncooperativeness in Studies 1 and 3 but did not predict Behavior Profile scores in any sample.

The measures of the patient's dental anxiety were closely related to his rated cooperativeness during treatment. This association was significant for the Maternal Questionnaire among the experienced samples of Studies 1 and 2. Similarly, the patient's own ratings of his fear of dentistry significantly predicted his rated cooperativeness. The comparable correlations between cooperativeness and the dentist's pre-treatment ratings of fear of dentistry are probably inflated by their reliance on two sets of judgments from the same person. On the other hand, the mother's ratings of the child's dental anxiety were uncorrelated with his cooperativeness.

The associations bewteen the patient's dental anxiety and Behavior Profile scores were not as strong. The Maternal Questionnaire was significantly correlated with this measure of disruptiveness only in Study 1. Similarly, maternal ratings of dental anxiety were significantly associated with Behavior Profile scores only in Study 2.

Notably, measures of maternal anxiety were inconsistently and largely non-significantly related to the child's behavior during treatment. The only exceptions were the correlation between the mother's rating of her state anxiety with low cooperativeness in Study 3, and the correlation between maternal dental anxiety on Corah's scale with Behavior Profile scores in Study 2.

The Child's Self-reports of Dental Anxiety

Tables 1 and 2

Table 3 displays correlations between Melamed et al's scale of the child's dental anxiety and the other measures. Like disruptiveness during treatment, the child's fear of dentistry decreased with age, but this relationship was significant only in Study 1. Measures of state and trait anxiety, as would be expected, were associated with higher reports of dental anxiety, although only three of the 12 coefficients involved achieved significance. A similarly positive correlation was present between the child's self-reported fear of dentistry and other measures of dental anxiety. These relationships were significant for the dentist's rating in Studies 1 and 3, the mother's rating in Study 3, and the Maternal Questionnaire in Study 2.

Maternal anxiety again was inconsistently and mostly nonsignificantly related to the child's verbalized fear of dentistry. The only exception was

Table 3

the significant correlation of this measure with mothers' self rating of situational anxiety in Study 3.

Discussion

The results disclosed only a modest relationship between behavioral and self-report measures of dental anxiety with the various predictor variables. In general, dental anxiety and disruptiveness were negatively related to the child's age as well as his state, trait, and dental anxiety. However, many of these correlations were not significant. In fact, even the combined use of several predictors of uncooperativeness by multiple regression procedures was not helpful, as the specific variables and weights of the regression equations were not replicated across samples. Therefore, these analyses were not reported. These findings suggest that the child's anxiety toward dental treatment is complexly determined, so that future research should continue to include multiple measures.

In accordance with our previous study and Melamed et al[9,10], there were inconsistent and nonsignificant relationships between the experienced patient's dental anxiety or uncooperativeness in treatment and his mother's anxiety -- whether state, trait, or dental. We had previously suggested that such relationships might be confined to the first treatment session, during which the mother's and patient's state anxiety might reach its peak. However, this association was largely absent among the inexperienced patients in Study 3 and children studied in their initial visit to the dentist by Melamed et al.[10] It is not clear why these recent reports contradict earlier findings relating maternal trait anxiety and the pedodontic patient's uncooperativeness in treatment[1-6]. Perhaps unidentified sample differences are involved, but this is unlikely in view of the similar findings by Melamed et al in Cleveland and ourselves in Rochester. The fact that two thirds of the subjects in Studies 2 and 3 were exposed to modeling procedures is also not relevant, because the correlations obtained among patients without such an experience were very similar.

Conclusion

Clearly, there is a need for reevaluating the popular belief that the child's dental anxiety is acquired through imitation of his mother's attitudes or by direct maternal reinforcement of such fears. This theoretical position is grounded on what Chess[18] has termed mal de mère, the tendency to blame the mother for most of the child's psychological disorders. It may well be that parental fear of dentistry played a role in the phobic levels of fear of dentistry uncovered in some studies[19-21], but parental influence appears much less important for the moderate disruptiveness or anxiety observed in the unselected samples studied in the present research. Among such patients, fear of dentistry is more likely determined by unspecified situational factors[22] and like most other fears of childhood[23], tends to decrease with age.

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Table 1

Correlations Between Rated Cooperativeness and Predictors

Variable			Study 1	Study 2	Study 3
Child	Age		.126	.279	.273
	State Anxiety	Maternal Rating[a]	.107	.137	.023
		Picture Test	-.134	-.119	-.149
		How I Feel[b]	-.480^{xx}	-.053	-.084
	Trait Anxiety[b]		-.341^{x}	.042	-.432^{xx}
	Dental Anxiety	Maternal Questionnaire[a]	.345^{xx}	.385^{x}	.066
		Self report[c]	-.259^{x}	-.355^{x}	-.677^{xx}
		Maternal Rating	-.293	-.213	.013
		Dentist's Rating	-.726^{xx}	-.416^{xx}	-.352^{x}
Mother	State Anxiety	Rating[a]	.224	-.209	.424^{xx}
		Self Evaluation[d]	-.065	.240	-.157
	Trait Anxiety[d]		-.006	.241	-.210
	Dental Anxiety	Corah	.092	-.191	-.178
		Melamed	.088	-.202	-.176

[a]A high score on this scale represents low anxiety. The ratings of state anxiety were made by the patient's mother on the Maternal Questionnaire.

[b]From Spielberger et al's How-I-Feel Questionnaire.

[c]From Melamed et al's scale of dental anxiety.

[d]From Spielberger et al's Self Evaluation Questionnaire

$^{x}p < .05$

$^{xx}p < .01$

Table 2

Correlations Between the Behavior Profile Scale and Predictors

Variable			Study 1	Study 2	Study 3
	Age		-.329^{xx}	-.410^{xx}	-.008
	State Anxiety	Maternal Rating[a]	-.048	-.162	.067
		Picture Test	-.057	.155	-.156
		How I Feel[b]	.202	.112	-.028
Child	Trait Anxiety[b]		-.162	.111	.045
	Dental Anxiety	Maternal Questionnaire[a]	-.238^{x}	-.092	.113
		Self Report[c]	.347^{xx}	.123	.018
		Maternal Rating	.101	.326^{x}	-.071
		Dentist's Rating	.126	.227	-.039
	State Anxiety	Rating[a]	-.152	.014	.104
		Self Evaluation[d]	-.058	.079	-.344
Mother	Trait Anxiety[d]		-.018	.150	-.043
	Dental Anxiety	Corah	-.116	.330^{x}	-.272
		Melamed	-.091	.291	-.112

[a]A high score on this scale represents low anxiety. The ratings of state anxiety were made by the patient's mother on the Maternal Questionnaire.

[b]From Spielberger et al's How-I-Feel Questionnaire.

[c]From Melamed et al's scale of dental anxiety.

[d]From Spielberger et al's Self Evaluation Questionnaire.

$^{x}p < .05$

$^{xx}p < .01$

Table 3

Correlations Between the Child's Self-reported Dental Anxiety and Predictors

Variable			Study 1	Study 2	Study 3
Child	Age		-.303[x]	-.241	-.173
	State Anxiety	Maternal Rating[a]	-.217	-.244	-.226
		Picture Test	.012	.306[x]	.263
		How I Feel[b]	.281[x]	.220	.296
	Trait Anxiety[b]		.155	.191	.450[x]
	Dental Anxiety	Maternal Questionnaire[a]	-.167	-.329[x]	-.301
		Maternal Rating	.384[xx]	.290	.337
		Dentist's Rating	.386[x]	.268	.415[x]
Mother	State Anxiety	Rating[a]	-.082	.020	-.405[x]
		Self Evaluation[c]	.157	.131	-.072
	Trait Anxiety[c]		.103	-.175	-.052
	Dental Anxiety	Corah	-.054	.101	.178
		Melamed	-.082	.020	.041

[a]A high score on this scale represents low anxiety. The ratings of state anxiety were made by the patient's mother on the Maternal Questionnaire.

[b]From Spielberger et al's How-I-Feel Questionnaire.

[c]From Spielberger et al's Self Evaluation Questionnaire.

[x] $p < .05$

[xx] $p < .01$